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Due Date: December 30, 2002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Applicant: | Brian D. Gantt | Examiner: | Mylinh T. Tran |
| Serial No.: | 09/464,557 | Group Art Unit: | 2174 |
| Filed: | December 16, 1999 | Docket: | G&C 30566.71-US-01 |
| Title: | VISUAL CLUES TO NAVIGATE THREE-DIMENSIONAL SPACE IN A COMPUTER-IMPLEMENTED GRAPHICS SYSTEM | | |

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By Isabell Ogata
Name: Isabell Ogata

Commissioner for Patents
Washington, D.C. 20231



Dear Sir:

We are transmitting herewith the attached:

☒ Transmittal sheet, in duplicate, containing a Certificate of Mailing under 37 CFR 1.10.
☒ BRIEF OF APPELLANT (in triplicate).
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**Due Date: December 30, 2002**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

| | |
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| In re Application of: | |
| Inventor: Brian D. Gantt | Examiner: Mylinh T. Tran |
| Serial #: 09/464,557 | Group Art Unit: 2174 |
| Filed: December 16, 1999 | Appeal No.: _____ |
| Title: VISUAL CLUES TO NAVIGATE THREE-DIMENSIONAL SPACE IN A COMPUTER-IMPLEMENTED GRAPHICS SYSTEM | |



**BRIEF OF APPELLANT**

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In accordance with 37 C.F.R. §1.192, Appellant's attorney hereby submits the Appellant's Brief on Appeal from the final rejection in the above-identified application, in triplicate, as set forth in the Office Action dated July 30, 2002.

Attached is PTO-2038 Credit Card Payment Form in the amount of $320.00 to cover the required filing fee for this Appeal Brief, as set forth under 37 C.F.R. §1.17(c). Please charge any additional fees or credit any overpayments to Deposit Account No. 50-0494 of Gates & Cooper LLP, attorneys of record in the present application.

## I. REAL PARTY IN INTEREST

The real party in interest is Autodesk, Inc., the assignee of the present application.

## II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences for the above-referenced patent application.

III. STATUS OF CLAIMS

Claims 4, 7-9, 14, 17-19, 22 and 25-27 are pending in the application.

In the final Office Action dated July 30, 2002, claims 1-6, 10-16, and 20-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takeda, U.S. Patent No. 6,166,718 (Takeda) in view of Frasier et al., U.S. Patent No. 5,268,677 (Frasier) and further in view of Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky).

In the final Office Action dated July 30, 2002, claims 8, 9, 18, 19, 26, and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takeda in view of Frasier, further in view of Lumelsky, and further in view of Caddy, U.S. Patent No. 4,578,766 (Caddy).

However, in the final Office Action dated July 30, 2002, claims 7, 17, and 25 were indicated as being allowable if rewritten in independent form to include the base claim and any intervening claims.

In the Amendment under 37 C.F.R. 1.116 dated September 30, 2002 submitted in response to the final Office Action dated July 30, 2002, claims 1-3, 5-6, 10-13, 15-16, 20-21 and 23-24 were cancelled, and claims 4, 7-9, 14, 17-19, 22 and 25-27 were amended.

The Advisory Action dated October 18, 2002 mailed in response to the Amendment under 37 C.F.R. 1.116 submitted on September 30, 2002 indicated that claims 7, 8, 17, 18, 25 and 26 were allowed, but that claims 4, 9, 14, 19, 22 and 27 were rejected.

IV. STATUS OF AMENDMENTS

The amendments made on September 30, 2002, subsequent to the final rejections in the Office Action dated July 30, 2002, were entered as indicated in the Advisory Action dated October 18, 2002.

V. SUMMARY OF THE INVENTION

Rejected independent claims 4, 9, 14, 19, 22 and 27 are generally directed to providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system. A two-dimensional viewport of the three-dimensional space is displayed on a monitor attached to the computer. A cursor is moved through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer. A position of the cursor is determined within the three-dimensional space relative to the two-

dimensional viewport. A visual representation of the cursor is generated to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the visual representations differ among independent claims 4, 9, 14, 19, 22 and 27, as described in more detail below.

With regard to independent claims 4, 14 and 22, these claims recite that the generating step or means comprises a step of or means for varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

With regard to independent claims 9, 19 and 27, these claims recite that the generating step or means comprises a step of or means for adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

With regard to rejected claims 4, 9, 14, 19, 22 and 27, refer to the specification as follows:

(a) at page 3, lines 6-21;

(b) at page 5, line 7 through page 7, line 2 and in FIGS. 1 and 2 as reference numbers 100-108 and 200-210;

(c) at page 7, line 13 through page 9, line 5 and in FIGS. 1 and 2 as reference numbers 106, 108, 208 and 210;

(d) at page 9, lines 21-23 and in FIG. 4C as reference numbers 414-418;

(e) at page 10, lines 1-7 and in FIG. 4D as reference numbers 420-424; and

(f) at page 10, line 14 through page 12, line 2 and in FIGS. 5 and 6 as reference numbers 500-510 and 600-608.

## VI. ISSUES PRESENTED FOR REVIEW

1. Whether claims 4, 14 and 22 are obvious under 35 U.S.C. §103(a) in view of the combination of Takeda, U.S. Patent No. 6,166,718 (Takeda), Frasier et al., U.S. Patent No. 5,268,677 (Frasier) and Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky).

2. Whether claims 9, 19 and 27 are obvious under 35 U.S.C. §103(a) in view of the combination of Takeda, U.S. Patent No. 6,166,718 (Takeda), Frasier et al., U.S. Patent No.

5,268,677 (Frasier), Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky) and Caddy, U.S. Patent No. 4,578,766 (Caddy).

## VII. GROUPING OF CLAIMS

The rejected claims do not all stand or fall together. All of the rejected claims are generally directed to providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, and have a number of common limitations, as recited in the claims. However, the claims differ in certain limitations.

Consequently, the claims are grouped as follows:

(a) claims 4, 14 and 22 directed to varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(b) claims 9, 19 and 27 directed to adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

## VIII. ARGUMENT

### A. The Office Action Rejections

As noted above, the final Office Action dated July 30, 2002, rejected claims 1-6, 10-16, and 20-24 under 35 U.S.C. §103(a) as being unpatentable over Takeda, U.S. Patent No. 6,166,718 (Takeda) in view of Frasier et al., U.S. Patent No. 5,268,677 (Frasier) and further in view of Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky), and rejected claims 8, 9, 18, 19, 26, and 27 under 35 U.S.C. §103(a) as being unpatentable over Takeda in view of Frasier, further in view of Lumelsky, and further in view of Caddy, U.S. Patent No. 4,578,766 (Caddy). Further, the final Office Action dated July 30, 2002 indicated that claims 7, 17, and 25 were allowable if rewritten in independent form to include the base claim and any intervening claims.

In the Amendment under 37 C.F.R. 1.116 dated September 30, 2002 submitted in response to the final Office Action dated July 30, 2002, claims 1-3, 5-6, 10-13, 15-16, 20-21 and 23-24 were cancelled, and claims 4, 7-9, 14, 17-19, 22 and 25-27 were amended in response to the final Office Action. Subsequently, the Advisory Action dated October 18, 2002 mailed in response to the

Amendment under 37 C.F.R. 1.116 submitted on September 30, 2002 indicated that claims 7, 8, 17, 18, 25 and 26 were allowed, but that claims 4, 9, 14, 19, 22 and 27 were rejected.

Consequently, this appeal is concerned with the rejections of claims 4, 14 and 22 under 35 U.S.C. §103(a) in view of the combination of Takeda, U.S. Patent No. 6,166,718 (Takeda), Frasier et al., U.S. Patent No. 5,268,677 (Frasier) and Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky), and with the rejection of claims 9, 19 and 27 under 35 U.S.C. §103(a) in view of the combination of Takeda, U.S. Patent No. 6,166,718 (Takeda), Frasier et al., U.S. Patent No. 5,268,677 (Frasier), Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky) and Caddy, U.S. Patent No. 4,578,766 (Caddy).

B. The Appellant's Claimed Invention

Rejected independent claims 4, 9, 14, 19, 22 and 27 are generally directed to providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system. A two-dimensional viewport of the three-dimensional space is displayed on a monitor attached to the computer. A cursor is moved through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer. A position of the cursor is determined within the three-dimensional space relative to the two-dimensional viewport. A visual representation of the cursor is generated to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the visual representations differ among independent claims 4, 9, 14, 19, 22 and 27, as described in more detail below.

With regard to independent claims 4, 14 and 22, these claims recite that the generating step or means comprises a step of or means for varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

With regard to independent claims 9, 19 and 27, these claims recite that the generating step or means comprises a step of or means for adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

C. The Takeda Reference

Takeda describes a video game system with a vertical array of cursor images. The cursor is displayed in a three-dimensionally displayed field as a plurality of cursor images three-dimensionally in a vertical array in the field. A plurality of different types of cursor images may be prepared as each of said cursor images, and displayed as each of said cursor images. Positions where at least selected ones of the cursor images are displayed may be changed in every predetermined period of time. The cursor images may be changed in shape as a viewpoint with respect to the field is changed in position.

D. The Frasier Reference

Frasier describes a reduced viewport feature for a graphics display system that allows an operator to observe manipulations on a graphics display of video image planes that are wholly or partially outside a viewing area. A two-dimensional input image plane in the form of a wireframe is transformed to a three-dimensional image plane due to manipulation, such as rotation and/or translation. The resulting three-dimensional image plane is subsequently mapped as a two-dimensional projection onto the graphics display. Transformation matrix coefficients are multiplied by a variable reduction coefficient to cause all points of the image plane to converge toward the center of the graphics display, resulting in the ability to view space which originally was not visible to the operator on an output video monitor.

E. The Lumelsky Reference

Lumelsky describes a stereoscopic cursor for a high-resolution stereoscopic raster display that is addressable to any arbitrary point on the display and simulates depth by alternately displaying left and right patterns that are offset from one another in a horizontal (x-axis) direction. Left and right views of the cursor are alternately displayed at the display frame rate, while a shutter mechanism presents the appropriate views to the viewer's eyes. To further enhance the perception of depth, monoscopic depth cues are provided by varying the cursor's color, size, transparency and/or pattern as the cursor moves in depth.

F. The Caddy Reference

Caddy describes a computer-aided process for automatically generating a camera-ready hardcopy of a graphical plot upon command instructions inputted via a conventional storage tube graphics display terminal having an addressable cross-hair cursor and a keyboard. In accordance with an interactive graphics code or program, tabular data coordinates stored in computer file form are retrieved and plotted on appropriately titled and scaled axes with the plotted coordinates being interconnected along curves formed of a smooth or linear nature by interpolation. The graphical plot viewed on the display terminal is further enhanced by inclusion of labels, shaded areas, and reference symbols and characters prior to printing out the hardcopy of an associated hardcopy unit coupled to the display terminal.

G. Appellant's Claims Are Patentable Over The Reference

Appellant's claims 4, 9, 14, 19, 22 and 27 are patentable over the references because they recite a novel and nonobvious combination of steps and elements. More specifically, the cited references do not teach or suggest the various visual representations of the cursor that are generated to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

The Office Action cites the combination of Takada, Frasier, Lumelsky and Caddy against the Appellant's claims (i.e., Takada, Frasier, Lumelsky against claims 4, 14 and 22, and Takada, Frasier, Lumelsky and Caddy against claims 9, 19 and 27). Specifically, Takada is cited as teaching the displaying, moving and determining elements, Frasier is cited as teaching the two-dimensional viewport of the three-dimensional space, Lumelsky is cited as teaching generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, and Caddy is cited for the use of projection lines and tag-along characters.

Appellant's attorney disagrees. Even when combined, the references do not teach or suggest the combination of elements shown in Appellant's independent claims 4, 9, 14, 19, 22 and 27.

For example, Lumelsky describes enhancing the perception of depth by providing monoscopic depth cues by varying the cursor's color, size, transparency and/or pattern as the cursor moves in depth. However, Lumelsky says nothing indicating the position of the cursor

within the three-dimensional space relative to the two-dimensional viewport by varying a reflectivity of the cursor, or by adding and subtracting tag along characters to the cursor.

Further, although Caddy was cited for the use of projection lines and tag-along characters, it includes no such teaching in conjunction with cursors, especially to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport. With regards to the Office Action's assertion that labels, shaded areas, reference symbols and characters are tag along characters added and subtracted to cursors, this assertion misinterprets both the Appellant's claims as well as the description in Caddy.

Tag along characters are defined in Appellant's specification at page 9, line 21 et seq. and are shown in FIG. 4C. Tag along characters, as defined, cannot be construed as mere labels, shaded areas, reference symbols and characters. Moreover, Caddy does not add or subtract labels, shaded areas, reference symbols and characters to the cursor.

Thus, Appellant's attorney submits that independent claims 4, 9, 14, 19, 22 and 27 are allowable over the cited references.

## IX. CONCLUSION

In light of the above arguments, Appellant's attorney respectfully submits that the cited references do not anticipate nor render obvious the claimed invention. More specifically, Appellant's claims recite novel physical features which patentably distinguish over any and all references under 35 U.S.C. §§ 102 and 103.

As a result, a decision by the Board of Patent Appeals and Interferences reversing the Examiner and directing allowance of the pending claims in the subject application is respectfully solicited.

Respectfully submitted,

Brian D. Gantt

By his attorneys,

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Date: December 30 , 2002

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## APPENDIX

4. A computer-implemented method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

7. A computer-implemented method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting concentric circles about the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

8. A computer-implemented method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting projection lines to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

9. A computer-implemented method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

14. A computer-implemented graphics system for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

17. A computer-implemented graphics system for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for adding and subtracting concentric circles about the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

18. A computer-implemented graphics system for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for adding and subtracting projection lines to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

19. A computer-implemented graphics system for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

22. An article of manufacture embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

25. An article of manufacture embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting concentric circles about the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

26. An article of manufacture embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting projection lines to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

27. An article of manufacture embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.